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UNITED STATES PATENT APPLICATION

OF

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FOR

SHIN REST

NCL PRFD. _____

SHIN REST

BACKGROUND OF THE INVENTION

5 Field of the Invention

[0001] This invention pertains to devices, referred to herein as "shin rests", that are attachable to a wearer's leg to prevent strain and/or discomfort, especially to the feet and ankles, while the wearer is in a kneeling position.

10 Related Art

[0002] Various kinds of activities require a person to assume a kneeling position for extended periods of time, for example, gardening, landscaping, tiling, installation of flooring or carpeting, and roofing. Most people find that kneeling for a protracted period can generate intense discomfort in their lower extremities. A partial solution for the alleviation of such discomfort is the known use of knee pads, which provide a cushion that is worn over the knees to cushion the knees from bearing directly against a hard surface or object.

SUMMARY OF THE INVENTION

[0003] Generally, the present invention provides a shin rest that is worn to support at least the wearer's shins and ankles while the wearer is in a kneeling position. The shin rest of the invention prevents or at least greatly reduces stress on the ankles and feet that, but for the shin rest of the invention, is ordinarily experienced in the unsupported toes-in or toes-out kneeling postures described below. The shin rest is preferably contoured and cushioned to comfortably engage the wearer's shin and the top of the wearer's foot or footwear. Fasteners such as straps are attached to the shin rest to hold it in place on the wearer's leg. In use, a shin rest of the present invention would, of course, be worn on each leg.

[0004] Specifically, in accordance with the present invention there is provided a shin rest having a body portion which is dimensioned and configured to have a length which extends from about the top of a wearer's foot at least to a point below the wearer's knee, a width which is at least sufficient to provide stable support for the wearer's leg when the wearer is in a kneeling position, and a depth, at least in the vicinity of the top of the wearer's foot, which is sufficient to provide support to the wearer's leg whereby to reduce the force imposed on the wearer's foot when the wearer is in a kneeling position, as compared to the force which, in the absence of the shin rest, would be imposed on the same wearer's foot in the same kneeling position. The

body portion has connected to it one or more fasteners, e.g., straps. The fasteners are dimensioned and configured to secure the shin rest to the wearer's leg.

[0005] Another aspect of the present invention provides a shin rest comprising the following components. A body portion comprised of (a) an outer shell having an outside surface and an inside surface, and (b) a cushion liner disposed on the inside surface of the shell is dimensioned and configured as follows. The body portion extends from about the top of a wearer's foot to at least a point on the wearer's shin below the knee, is of a width at least sufficient to provide stable support for the wearer's leg when the wearer is in a kneeling position, and is of a depth at least sufficient to reduce the force imposed on the wearer's foot when the wearer is in a kneeling position, as compared to the force which, in the absence of the shin rest, would be imposed on the same wearer's foot in the same kneeling position. One or more fasteners are connected to the body portion and are dimensioned and configured to secure the shin rest to the wearer's leg.

[0006] In particular aspects of the present invention, the body portion may have one or more of the following dimensions: a length of from about 12 to about 26 centimeters; a depth of about 5 to about 13 centimeters; and a width of from about 7 to about 13 centimeters.

[0007] Another aspect of the present invention provides that the body portion further comprises (a) an outer shell having an outside surface and an inside surface, and (b) a cushion liner, e.g., made of an elastomeric foam, lining the inside surface, which liner is dimensioned and configured to bear against the wearer's shin when the shin rest is secured to the wearer's leg.

[0008] Other aspects of the present invention comprise one or more of the following features, alone or in any suitable combination of two or more such features. The cushion liner may be dimensioned and configured to bear against the wearer's shin when the shin rest is secured to the wearer's leg; the outer shell may be comprised of a rigid material; the outer shell may have one or more bumper strips disposed on its outside surface; the cushion liner may be substantially coextensive with the outer shell; the fasteners may comprise straps and connectors to secure the straps to the wearer's leg; one or more of the straps may be dimensioned and configured to wrap around the wearer's lower leg, and one or more of the straps may be dimensioned and configured to wrap around the wearer's foot; the body portion, at least along the length thereof which extends from about the top of the wearer's foot to a point below the wearer's knee, may have a depth from about 5 to about 13 centimeters; the body portion may extend from about the top of the wearer's foot to and including the wearer's knee, so that the body portion comprises a shin pad and a knee pad; and the knee pad and the shin pad are connected by

an articulated joint to enable the knee pad to flex as the wearer bends and straightens his or her knee.

BRIEF DESCRIPTION OF THE DRAWINGS

- 5 [0009] Figure 1 and Figure 2 are elevation partial views of the leg of a kneeling person in, respectively, a toes-in and toes-out posture, showing the use of a knee pad in accordance with the prior art;
- [0010] Figures 3 and 3A are perspective views of a shin rest in accordance with a particular embodiment of the present invention;
- 10 [0011] Figure 3B is a front elevation view of the shin rest of Figures 3 and 3A, showing the outside surface of the outer shell;
- [0012] Figure 3C is a rear elevation view of the shin rest of Figures 3 and 3A, showing the cushion liner partly broken away;
- [0013] Figure 4 is an elevation partial view of the leg of a kneeling person wearing a shin rest in accordance with the present invention while in a modified toes-in posture;
- 15 [0014] Figure 4A is an elevation view of the leg of a kneeling person wearing a shin rest in accordance with the present invention while in a modified toes-out posture;
- [0015] Figure 5 is a view corresponding to Figure 3B of a second embodiment of a shin rest in accordance with the present invention; and
- 20 [0016] Figure 6 is a view corresponding to Figure 4A of a kneeling person wearing a shin rest in accordance with a third embodiment of the present invention, while in a modified toes-out posture.

DETAILED DESCRIPTION OF THE

INVENTION AND PREFERRED EMBODIMENTS THEREOF

- 25 [00017] Before describing embodiments of the present invention, a brief description of the problems it overcomes is useful.
- [00018] Two types of kneeling postures showing the use of knee pads in accordance with the prior art are illustrated in Figures 1 and 2. Figure 1 shows a known knee pad 110 comprising an interior cushion 110a and straps 112 and 114 worn by a person kneeling on a surface S. Cush-
- 30 ion 110a is typically made from an elastomeric foam encased in fabric and it is often contoured to fit the curvature of the knee when bent. Adjustable straps 112 and 114 extend around the leg from one side of cushion 110a to the other to keep the knee pad on the wearer's leg. Figure 1 shows a kneeling posture referred to herein as "toes-in" to indicate that the wearer's toes and,

optionally, the wearer's ankle, are flexed so that the toes point generally towards the knee. Figure 2 shows an alternative kneeling posture referred to herein as "toes-out", in which the wearer of knee pad 110, kneeling on the surface S, has his or her ankle and toes extended so that the toes point away from the knee. Despite the use of the knee pad 110, both the toes-in and toes-out postures tend to result in discomfort that is not ameliorated by the knee pad, because the foot, ankle and all or most of the shin are unsupported. In both the toes-in and toes-out kneeling postures, the feet are stressed, as they are bearing weight while in a curved position. Remaining in either kneeling posture for a protracted period of time causes discomfort and may cause or aggravate foot problems. In the toes-in posture of Figure 1, if the person kneels back to sit on his or her heels, some of the person's weight is borne on the toes, ankles and on the balls of the user's feet, quickly resulting in discomfort. In the toes-out posture of Figure 2, sitting back on the heels presses the ankle joint toward hyperextension and thus causes discomfort. Furthermore, footwear is generally not designed to sustain either a toes-in or toes-out posture, and the person's footwear can pinch or otherwise cause additional discomfort to the foot and ankle in these kneeling postures.

[00019] Shin rest 10 shown in Figures 3, 3A, 3B and 3C is representative of one particular embodiment of the present invention. Shin rest 10 comprises a body portion 12 to which a plurality of adjustable straps 14, 16 and 18 are attached. Body portion 12 is configured to have a back surface 20 which may be contoured to generally conform to a wearer's shin, i.e., back surface 20 may be made concave. In the illustrated embodiment however, a thick cushion liner 24, described below, is secured to back surface 20. Bottom surface 22 is also preferably concave or otherwise configured to engage or conform to the top of the wearer's foot or footwear. Fasteners, provided by leg straps 14 and 16 in this embodiment, are configured to reach around the user's leg to hold shin rest 10 on the user's leg. Other fasteners, provided by foot straps 18 in this embodiment, are configured so that they may extend around the bottom of the wearer's foot or footwear. The fasteners can be secured by any suitable connectors, to secure shin rest 10 in place with the bottom surface 22 thereof positioned against or closely adjacent to the top of the wearer's foot. Figures 3 and 3A show fabric-and-loop-type fasteners 19a, 19b of the type sold under the trademark Velcro®.

[00020] Body portion 12 of shin rest 10 preferably comprises a soft cushion liner 24 and a hard outer shell 26. Shell 26 is formed from a material that is strong enough to protect cushion 24 and the wearer's shin from hazardous objects such as sharp-edged stones, glass fragments, nails, etc., that may be on the surface on which the user is kneeling. Shell 26 may be made of any suitable material, such as a rigid plastic (synthetic organic polymeric material). By "rigid"

is meant a material which does not bend or deform to a significant extent under the wearer's weight when the wearer is in a kneeling position on the shin rest. A material having a flexural modulus similar or identical to the outer shell of a baseball catcher's shin guards would be an appropriate choice of material for the outer shell 26 of the shin rest 10 of the present invention.

5 Cushion liner 24 is shaped to conform at least somewhat to that portion of a wearer's shin which bears against it. The surface of cushion liner 24 which is contacted by the wearer's shin may thus be concave. Cushion liner 24 may be made from any of a variety of elastomeric foams of the kind useful in conventional knee pads, or any other suitable material, and the elastomeric foam may be encased in a suitable fabric casing, not shown.

10 [00021] Figures 4 and 4A illustrate the use of shin rest 10 by a wearer kneeling on the surface S. Shin rest 10 is preferably worn low on the shin so that the bottom surface bears against or is closely adjacent to the top of the wearer's foot or footwear. Fasteners comprised of the straps 18 are wrapped about the wearer's foot and fasteners comprised of the straps 14 and 16 are wrapped about the wearer's leg and ankle. The straps cooperate to keep shin rest 10 in place
15 on the wearer's leg. As illustrated in Figures 4 and 4A, strap 18 advantageously passes adjacent to the front of the heel of the wearer's boot or shoe. In one particular embodiment, any or all of the straps may comprise hook-and-loop-type fasteners 19a, 19b, such as the well-known Velcro® fasteners, although a variety of other types of straps and fasteners are well-known in the art as equivalent thereto and may be used in place thereof. In another embodiment, straps 14
20 and 16 may be replaced by a single strap. In the kneeling postures of Figures 4 and 4A, even if the user sits back on his or her heels, his or her foot need not be fully extended or bent, and the user's ankle and foot will not have to bear the full weight of his or her torso in the fully-extended position. Instead, a significant portion of the weight will be borne on the front of the shin by the support provided by the body portion 12 of shin rest 10.

25 [00022] In order to attain this purpose, shin rest 10 has a suitable depth D (Figures 3 and 4), which may be, e.g., from about 5 to about 13 centimeters (roughly, about 2 to 5 inches). Depth D should be great enough to take up at least some of the weight which would otherwise be borne by the wearer's feet in the kneeling position of Figure 4 (nominally, toes-in) or Figure 4A (nominally, toes-out). In both cases, the wearer's foot is bent only slightly, if at all, as compared to the prior art illustrated in Figures 1 and 2. Accordingly, the distinction between toes-in
30 and toes-out largely if not entirely disappears by use of the shin rest of the present invention. In both cases, shin rest 10 allows the user to sit back on his or her heels without causing undue stress or discomfort on the ankle, toes or feet.

[00023] The length L (Figure 4) may be any suitable length, e.g., from about 12 to about 26 centimeters (roughly, about 5 to 10 inches). The width W (Figure 1C) of shin rest 10 should be wide enough to provide stable support for the wearer's leg, or at least the lower leg, when the wearer is in a kneeling position.

5 [00024] Width W may be, e.g., from about 7 to about 13 centimeters (roughly, about 2 and 3/4 to about 5 and 1/8 inches). The shin rest may come in several sizes and the length L and the depth D, as well as the width W, may vary. The dimensions L and D, which may lie within or without the above ranges, are selected so that the beneficial effect of reducing stress on the wearer's feet, ankles and toes is attained as described above.

10 [00025] It is seen that, in the kneeling postures of both Figures 4 and 4A, the ankle, foot and toes are in less extreme flexure or extension relative to the kneeling postures of Figures 1 and 2, and discomfort caused by the stresses imposed on the foot as shown in Figures 1 and 2 is reduced by use of shin rest 10.

[00026] Figure 5 shows a second embodiment of the present invention comprising a shin rest
15 210, parts of which are identical to those of the embodiment of Figure 3B, and are numbered identically to those of Figure 3B. These identical parts therefore need not be further described. Shin rest 210 differs from shin rest 10 of Figures 3-3C in that there is disposed on the outside surface (unnumbered) of outer shell 26 a plurality of bumper strips 28 which comprise raised
20 strips of a soft, resilient material such as rubber, or a resilient, soft plastic material. Bumper strips 28 serve to prevent the rigid shell 26 from marring the surface on which the wearer is kneeling, e.g., a finished wood floor.

[00027] Figure 6 shows a third embodiment of the present invention wherein the shin rest
310 extends from about the top of the wearer's foot to above the wearer's knee and is comprised of a shin pad 30 and a knee pad 32. An articulatable joint 34 connects shin pad 30 to knee pad
25 32, thereby enabling shin pad 32 to flex to accommodate the wearer's movement, i.e., rising from and returning to a kneeling position. The lower portion, i.e., the portion closest to the wearer's foot, of shin pad 30 is constructed to be substantially the same as that illustrated with respect to the embodiment of Figures 3-3C. Bumper strips such as bumper strips 28 of the embodiment of Figure 5 may extend along the entire length of shin pad 30, and for at least that
30 portion of knee pad 32 which comes into contact with the surface S on which the wearer is kneeling. (Bumper strips 28 are not shown in Figure 6.) As with the other embodiments, fasteners in the form of straps 36, 38, 40 and 42 are provided to enable the wearer to strap shin rest 310 to his or her leg as shown. The overall length of shin rest 310 will usually be from about 35 to about 55 centimeters (roughly, 13 3/4 to 22 inches).

[00028] Obviously, the user will normally wear a shin rest in accordance with the present invention on each leg. Further, the straps, such as straps 36, 38, 40 and 42 of the embodiment of Figure 6, are provided with suitable connectors to enable adjustment of the straps to fit the wearer's leg and/or foot, and to secure the adjusted strap in place. Fabric fasteners of the type
5 sold under the trademark Velcro® are well suited for the purpose. Naturally, any other suitable types of fasteners may be employed, such as buckles, snaps or the like.

[00029] While the invention has been described in detail with reference to particular embodiments thereof, it will be understood by one of ordinary skill in the art upon a reading and understanding of the foregoing disclosure that numerous alterations and equivalent substitutions
10 to what is shown and described herein may be made without departing from the spirit or scope of the invention.